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ABSTRACT

This document contains two papers from a symposium on learning on the job. "Professional Crisis Workers: Impact of Repeated Exposure to Human Pain and Destructiveness" (Lynn Atkinson-Tovar) examines the following topics: (1) the secondary and vicarious traumatic stress disorder that affects many professional crisis workers who are repeatedly exposed to human pain and destructiveness; (2) ways human resource development (HRD) professionals can assess vicarious traumatization in crisis workers; (3) a four-phase basic stress management model consisting of education, prevention, support, and research phases that many organizations have adopted to help employees cope with job-related stress; and (4) questions related to HRD professionals' role in helping victims of secondary and vicarious traumatic stress disorder that merit further research. "The Transfer of Technology of Highly Skilled Foreign Workers for Thai Workers in Thailand" (Boon-Anan Phinaitrup) reports on study of a sample of 350 Thai workers, foreign workers in Thailand, Thai entrepreneurs and human resource managers, and institution administrators that examined how information and education are transferred from highly skilled foreign workers to Thai employees in Thailand's manufacturing industry. The advantages and disadvantages of employing foreign workers were discussed along with the following technology transfer methods: on-the-job training; in-house training; training abroad; and training in Thailand. Both papers include substantial bibliographies. (MN)

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Professional Crisis Workers:
Impact of Repeated Exposure to Human Pain and Destructiveness

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This paper discusses some of the issues related to the impact on professional crisis workers when exposed to repeated human pain and destructiveness in the course of their work lives. It is a brief summary of the limited literature on the two prevailing effects of repeated exposure predominately gathered through studies on therapist, however the author identifies other crisis workers who's effect of repeated exposure to trauma needs to be researched further.

Key words: Repeat Exposure, Crisis Workers, Affect of Trauma

The United States and the world changed forever Tuesday September 11, 2001. Today, more than ever HRD must acknowledge the area of trauma and how it effects crisis workers who are repeatedly exposed to human pain and destructiveness. These are the people who have chosen a career in helping others deal with pain and trauma but do not realize or recognize how what they see, hear, smell, taste and feel affects them on a daily basis. Their responses to human pain and destructiveness are so subtle and long-term that they do not realize what is happening to them until they begin to lose what is most important in their lives: their families, friends, health, spirituality, honor, commitment, and sense of self-worth. Life experience(s) have always been an important component of adult learning theories (Dewey, 1983; Knowles, 1970, Kolb, 1984). A number of studies have also identified job experience as a powerful stimulus for organizational and managerial development (Morrison, 1986). Morrison (1986) posed that on the job work experiences, rather than formal training events, were the main source of development for individuals in organizations. Contextual features of this type of development, such as the presence of organizational support, appear to be critical. It is incumbent upon HRD practitioners to help these organizations, which are comprised of crisis workers who devote their careers to helping others. HRD must have an understanding of what these men and women are doing on a daily basis and how it affects their lives and those around them. The acknowledgement of the organization to provide resources and direction through HRD is critical in the well being of their employees who deal with crisis daily. The development and continued education through employee assistance programs or peer counseling is a beginning, however HRD has the responsibility to the crisis workers as well as the organization to strive for personal acceptance and organizational development. They need to recognize how trauma affects them, both in their professional and personal lives (Kates, 2001).

Looking at the Literature: Daily Trauma in the Workplace

Stress is an always-present component of our lives. Factors such as the pace of current technology, economic instability, complexity of interpersonal relations, and the ever-growing crime rate have produced a society that must respond to a barrage of problems and changes in a timely manner. Constantly, individuals are asked to take on more and more responsibilities and become increasingly more efficient at the performance of their job (Senkor, 1995). The increased complication comes with the factor of exposure to traumatic events during the course of a day. However, HRD has the role of a change agent in the development and well being of the employee. HRD practitioners have the responsibility for the induction of interventions designed to bring about organizational change through people. Every organization today is seeking ways to address problems that affect performance. Ovaice (2000) stressed the importance of considering human factors when discussing organizational performance. All organizations possess cultural norms that frame expectations and influences strategic support and perceptions of effectiveness. With crisis workers and their ever changing professional life of trauma exposure requires the HRD practitioner to be an aggressive change agent to maximize the effectiveness of interventions as well as improve communications and relationships.

This paper will examine secondary and vicarious traumatic stress disorder and the role HRD professionals can influence through their understanding and effectiveness in program development. There has been sporadic attention given to the caring professionals; medical, social sciences, family therapy, law

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enforcement, and psychological literature to the phenomenon referred to as secondary/vicarious traumatic stress disorder. So it is prudent that HRD take a closer examination into the development of strategic assistance mechanisms for professional organizations that can be affected by stress related performances from their employees. Helping organizations offer a greater challenge to HRD professionals in that they are so resistant to accept assistance from those who they believe do not understand their unique culture. There is a vast amount of literature, which describes a variety of stress related areas, however the literature is limited in the area of those crisis workers who are repeatedly exposed to human pain and destructiveness. In this review of contemporary literature the author will cite and describe specific impacts to professional workers and their organization when exposed to human pain and destructiveness in the course of their work lives. The paper provides a look into the two potential stress related outcomes for crisis workers exposed to repeated trauma that HRD practitioners might be able to influence through program design and alternative thinking. Further research is required in examining the outcomes of active HRD program development to demonstrate employee change and effectiveness. After reviewing the literature on the effects of trauma to crisis workers, it appears there is no set course or path a professional might follow; however, the dilating factor is the severity of the symptoms and treatment. Researchers (Matthews, 1987) agree, generally, that people-oriented occupations are more stressful than occupations which require persons to work alone or in small groups with data because they are more predictable rather than people who are unpredictable (Farber, 1983: Gherman, 1981; Maslash, 1982: Pines & Kafry, 1978). Matterson and Ivancevich (1982) reported a study, which showed that individuals having responsibility for other people suffered from more heart disease than individuals who had responsibility of objects. Stressors do affect workers differently because of a number of genetic and environmental factors, such as personality type; metabolism rate; physical condition of the body as a result of exercise, rest, and disease; and the use of self-regulation techniques; however, stress has been associated with a number of practices, which occur within the organization itself. Because people-oriented occupations are in a variety of work settings and involved numerous types of interactions, it seems plausible that different work environments impose more or less of the practice associated with stress. Matthews & Casteel (1987) did a study on stress and the workplace; a comparison of occupational fields. The study examined if persons in different people-oriented occupational fields would have significantly different scores by comparing crisis workers such as the health and social services fields with banking and industry. They found that most people believe their jobs are stressful, however the study showed especially those who work with children, the needy, and physically ill, feel their environment is more stressful, and they have a higher burnout rate.

Secondary Traumatic Stress Disorder (STSD)

Secondary traumatic stress disorder can be defined as "the natural consequent behavior and emotions resulting from knowing about a traumatizing event experienced by a significant other-the stress resulting from helping or wanting to help a traumatized or suffering person" (Figley, 1995, p.7). Therefore, STSD has symptoms nearly identical to post traumatic-stress disorder (PTSD), except that exposure to knowledge about a traumatizing event experienced by a person is associated with the set of STSD symptoms, and PTSD symptoms are directly connected to the sufferer, the person experiencing primary traumatic stress. Symptoms under one month duration are considered normal, acute, crisis-related reactions. Secondary traumatic stress disorder is a natural consequence of caring between two people, one of who has been initially traumatized and the other of whom is affected by the first's traumatic experiences. These effects are not necessarily a problem but a natural by-product of caring for traumatized people (Figley, 1995). There as been a side range of STSD symptoms documented in crisis workers. The literature exemplifies diverse occupational samples, differences in measurements, differing traumatic event factors, and degree of proximity to harm, as well as mediating contextual variables and workers characteristic (Beaton & Murphy, 1995). Crisis workers perceive a role conflict when they themselves must seek help. They feel out of control, weak, and vulnerable, and their self-worth may be in question. Furthermore, most crisis workers consciously and unconsciously use defense mechanisms such as denial, repression, black humor, and suppression, to deceive themselves, as well as others (Beaton & Murphy, 1995). A second barrier is that often times family members, and co-workers cannot detect symptoms as secondary trauma because they are subjective in nature. Family and friends find it difficult to understand because they believe that the crisis worker must have known what they were getting themselves into. Crisis workers often will second guess their decisions, engage in self-blame, and become depressed. "Finally, traumatized crisis workers are subjected to more stigma than most victims. Their traumatization is troubling to their supervisors and co-workers since it reminds them it could also happen to them" (Beaton & Murphy, 1995 p.75).

Vicarious Traumatization

The concept of vicarious traumatization, introduced by McCann and Pearlman (1989) provides a theoretical framework for understanding the complicated and often painful effects of trauma work on therapist, however the theory can apply to crisis workers in general. Previously stated, secondary traumatic stress disorder was described as the responses of individuals to hearing about other peoples' traumatic experiences. Vicarious traumatization includes the symptoms of STSD in the context of profound changes in the crisis workers sense of meaning, identity, world-view, and beliefs about self and others. However, even though there is some overlapping between STSD and vicarious traumatization the differ lies in the focus and emphasis. Vicarious traumatization, (Pearlman & Saakvitne, 1995) refers to transformation in the crisis workers inner experience resulting from empathic engagement with clients' trauma material. Through exposure to graphic accounts such as child sexual abuse experiences and to the realities of peoples' intentional cruelty to one another, and through the inevitable participation in traumatic reenactments, the crisis worker is vulnerable through their empathic openness to the emotional and spiritual effects of vicarious traumatization. These effects are cumulative and can be permanent, evident in both crisis workers' professional and personal life. Crisis workers acknowledge they entered this type of work by choice, and continue because of their commitment to others and the tremendous rewards of helping others, recognize that it affects them personally. It is an occupational hazard that must be acknowledged and addressed.

McCann & Pearlman's (1989) recent research in vicarious traumatization focuses primarily on the portion of the theory that describes psychological needs and cognitive schemas. The cognitive portion of the theory is based upon a constructivist foundation. The underlying premise is that human beings construct their own personal realities through the development of complex cognitive structures, which are used to interpret events (Mahoney, 1981). Piaget (1971) describes these cognitive structures as schemas. These schemas or metal frameworks include beliefs, assumptions, and expectations about self and world that enables individuals to make sense of their experiences. These cognitive structures evolve and become increasing more complex throughout your life span. McCann & Pearlman's major hypothesis in their research is that trauma can disrupt these schemas and that the unique way that particular trauma is experienced depends in part, upon which schemas are central or salient for the individual (1989). Vicarious traumatization is unique to trauma or crisis workers, because first, traumatic events such as child sexual abuse are painfully real and part of our larger world and society. If crisis workers are to help, they cannot protect themselves from acknowledging this reality as they listen to the victim's stories. Crisis workers are left with the powerful affects stirred as they face this reality on a daily basis. Secondly, trauma or crisis workers inevitably become aware of the potential for trauma in their own lives. Traumatic events can happen to anyone, at any time; it is almost intolerable however to accept the fact that lives can be permanently changed in a moment when a traumatic event occurs. And, thirdly often times crisis workers have gone into the profession because they were victims of trauma, such as childhood sexual abuse, and it is reminder of their own painful experience(s). Crisis workers are often helpless witnesses to current reenactments of traumatic memories, which can be an excruciating experience. These reenactments can be expressed at many levels: behavioral, emotional, and physiological (van der Kolk, 1989).

Assessing Vicarious Traumatization

Trauma disrupts the self in specific ways, disrupting the frame of reference, which is an individual's sense of identity, central beliefs in the world, and spirituality. The loss of a familiar sense of identity is disturbing and often times a by-product of a crisis workers profession. Often the crisis worker will question who they are as a professional, a man or women, husband or wife, parent or child. They can also lose their central belief in the world, the way they understand the world, including, life philosophy, and moral principles. For example, world views can be challenged including the beliefs that people behave according to a set of values, that the world is fundamentally just, that people can influence outcomes in their lives, that the future is bright, and so forth (Pearlman & Saakvitne, 1995). Being that crisis workers are exposed to prevalence and acceptance of violence, cruelty, and bigotry, the emergence of cynical beliefs about the world, such as the idea that life events are random or that people are basically malevolent or selfish, is not uncommon (Janoff-Bulman, 1985) which is the central symptom of vicarious traumatization. The worst symptom however of vicarious traumatization is the loss of a sense of meaning for one's life, a loss of hope and idealism, a loss of connection with others, and a devaluing of awareness of one's experience...spirituality. Pearlman and Saakvitne (1995) believe the larger sense of meaning and connection is crucial psychological well being in general and disruption in this realm may be the most troubling, and perhaps the least explored. Crisis workers who work with victims are exposed to the many cruel ways that people deceive, betray, or violate the trust of other human beings. They become suspicious of other peoples' motives, more cynical, or distrustful, sometimes expecting the worst from people. Personal safety becomes an issue especially those crisis

workers who work with victims of crime, might experience increased thoughts and images associated with personal vulnerability, such as a love one being killed in a car accident, or over time may experience an enhanced awareness of the fragility of life. There can be a disruption in psychological needs, safety, trust, esteem, control, and intimacy, which motivates behavior which are particularly susceptible to change through traumatic experiences (Pearlman & Saakvitne, 1995). Understanding that adults learn primarily through the acquis ition of knowledge by study and/or experiences the HRD expert must foster improved performance so that the organization can function efficiently in the personal growth and development of employees. Applying the Humanistic approach to crisis workers and their unique work environment maintains that all people are unique and possess individual potential. "It also maintains that all people have the natural capacity to learn; thus, the purpose of learning is to encourage each individual to develop to his or her full unique potential (Gilley, 1989 pp121)" "Based on life experiences, people develop beliefs founded in these needs and their ability to meet them, which, in turn, shape their perceptions of new life experiences. When, as a result of trauma, an individual believes certain basic needs cannot and will not ever be met (e.g., "I am never safe, " "People are not trustworthy, " " I am not worthy of being loved"), these beliefs shape relationships, identity, and access to hope or despair" (Pearlman & Saakvitne, 1995, p. 162). Vicarious traumatization has a profound effect on a crisis worker's interpersonal relationships; if they believe that others are not trustworthy or valuable for example, it is difficult to have a rewarding relationship. Similarly, one's belief about oneself can also lead to interpersonal disruptions; social withdrawal, inability to tolerate the wide range of feelings necessary to maintain intimate relationships, feeling alienated from intimate friends and sexual partners because of their unique work, inability to enjoy common forms of entertainment, or one can become less available to others because of the demands of work (Pearlman & Saakvitne, 1995). This area of understanding is critical for the HRD change agent; the lack of trustworthiness and relationship development complicates the program design potential learning experience.

Future Research Questions

There is a cost to those who are in the caring and crisis profession. "Professional who listen to clients' stories of fear, pain, and suffering may feel similar fear, pain, and suffering because they care" (Figley, 1995, p.1). There as been sporadic attention given to the caring professionals even though there is clear identification of the phenomenon of secondary traumatic stress disorder in the DSM-III and DSM-IV, however nearly all the attention has been directed to those people in harm's way rather then those who care for and worry about them. Research questions that need to be addressed.

- How can HRD practitioners make a contribution to change within the crisis worker and his/her personal and professional development?
- How can learned experiences from trauma exposure be affected through program development and design?
- How can HRD and management build a working relationship of trust to assist their employees through difficult times of stress?

Discussion and Implications to HRD

HRD practitioners must perform several different activities and duties, such as design, develop, and implement learning programs and training activities within an organization. Without the understanding of what crisis workers are exposed to and the effect the trauma causes in their professional and personal lives HRD cannot and will not make an impact to the organization. They need to understand in order to make a needs assessment as well as an evaluation of programs involving the crisis worker learner. Human resource development implies the development of people in an organization as well as financial and capital resources. Since HRD is the development of people within the organization, it is critical for the well being of the organization for HRD practitioners to face the day-to-day events of the crisis worker and their lives. "The development of the people refers to the advanced knowledge, skills, and competencies, and the improved behavior of people within the organization for their personal and professional use (Gilley, 1989, pp5)." The role for the HRD practitioner is their commitment to the professional advancement of people within the organization through career development and understanding to bring about change within the crisis worker.

Embarrassment and fear may prevent crisis workers from seeking support from family, friends, or outsiders (Kates, 2001). The idea of asking for help from anyone let alone an outsider is unsettling for several reasons, first usually the "macho" value of their occupations. There is a kind of natural personification, which makes many crisis workers resistant to seeking help. Men and women who gravitate to specific crisis occupations, such as police

officer, fire fighter or emergency medical worker believe you do not talk about your problems; you do what you have to do. Secondly, crisis workers resist seeking help due to a unique and overwhelming phenomenon of secrecy, which permeates many of their cultures. Secrecy for crisis workers stands as a shield against the attacks of the outside world; against bad media reports and against public criticism. Secrecy is loyalty, it represents sticking with their group, and its maintenance carries with it a profound sense of participation. Secrecy is solidarity; it represents a common front against the outside world and consensus in at least one goal (Westley, W. 1970). Social interaction of groups in any crisis occupation is important after a traumatic event to help reduce psychological symptomatology. Lindy, Grace, & Green (1981) first described this function as the "trauma membrane" effect, where a network of trusted, close persons served to protect traumatized persons from further distress (Violanti, 1997). However some experts believe the key to handling stress maybe the ability to disconnect from their secret world-to see their work as a job not an identity. Measuring stress and coping can be quite a challenge for the organization and the HRD professional, much of the significant activity goes on "between the ears" and thus is not readily observable. Though most crisis organizations offer some type of counseling either through an employees assistance program, peer support group or health insurance, taking advantage of them can kill a career. Crisis workers have realize organizations have used information gathered by psychological services to weed out certain workers. Any crisis worker who admits to feeling depressed or enraged feels they put their career in jeopardy, or at least risks being transferred to a desk job (D'Antonio, 1999). Crisis workers may need to ask for help, it does not mean you have to do it alone, it also may mean seeking medical or psychological assistance. Violanti (cited in 1996 p.103) has developed a four-phase basic stress HRD model, which many organizations have adopted. The phases are (1) educate, (2) prevention, (3) support, and (4) research. A well-rounded stress education program should include identification of stress, the value and techniques of physical exercise, the benefits of proper nutrition, and the exposure to interpersonal communication methods. It is important to begin the education during the first phase of a crisis worker's career, however during the in-service level, instruction on coping strategies should take priority because these workers have most likely already been exposed to the effects of stress. Understanding the relationship of crisis workers and their fear of acknowledging stress related to their work has several implications for HRD professionals. First, as HRD professionals tend to serve increasingly as change agents and internal consultants within organizations, those who work within the crisis field need to build a trusting relationship with the crisis worker in their day-to-day communications. Trust becomes a foundation in a joint commitment to the organization and the citizens they serve, which results in the proficiency and effectiveness of the crisis worker. The HRD professional will have to identify the implications of these day-to-day communications through their trust of the unique culture and the development of specific programs through instructional design, training and counseling. Schurr and Ozane (1985) suggested trust leads to "a constructive dialogue and cooperation in problem-solving, facilitates goal clarification, and serves as a basis of commitment to carry out agreements (pp.9)."

Support from the crisis workers' organization and family is a critical factor in the troubled person's decision to seek help. Many organizations are utilizing employee assistance programs, which provide 24-hour service calls and confidential counseling. In addition, psychological debriefings can be an important technique in helping crisis workers with traumatic events. Providing debriefing soon after an incident allows the crisis worker to vent their feelings and discuss the occurrence in a supportive group setting (Mitchell, 1990). Peer support groups consisting of professionals in the same occupation, not psychologist who are primarily there as someone to talk to. These support groups or individuals can assist members involved in a traumatic incident or continued exposure to trauma. Each organization is, in a sense, unique and has its own set of stress related problems. It is therefore necessary to conduct ongoing research into the causes and minimization of stress. More research into the implications of repetitive and addictive traumatic stress phenomena is also required to augment support and psychological strategies.

Conclusion

Stressful traumatic events or repeated exposure to traumatic incidents can be described as unusual occurrences involving exposure to events that are sudden, overwhelming and emotionally challenging. The past decade has witnessed a growing recognition that the professionals who are called upon to assist those affected by traumatic events can themselves become secondary victims. Occupations such as police work, fire fighting, emergency services, hospital, health and social services, mental health professions, and rescue workers may be more susceptible to traumatic aftereffects as a result of either primary or secondary involvement with trauma. Perhaps the most important dimension of this exposure to a traumatic event(s), whether direct or secondary, is that a consequence is usually atypical in nature, its intensity and duration may cause the crisis worker to be unable to draw upon previous learning, training, or experience to help them understand the event or their reaction to it (Paton, 1996). Exposure to such an event can trigger feelings and emotions which, are normal in the context of the traumatic experience, can be

difficult to understand and manage. If these feelings continue over time, dysfunctional reactions can occur and affect their well being, their families, and their organizational performance.

Preparation for potential critical occupation workers makes good sense. As a result of the horrific terrorist act committed against our nation, the trauma crisis workers are being exposed to have been forced to the front pages of many newspapers. HRD experts in many of the crisis workers organizations are being catapulted to action with little knowledge of how to help. HRD practitioners cannot wait for a tragic act to propel them toward program design; employees are being exposed on a day basis. While members of these high-risk occupations may possess the technical skills required to meet the needs presented by victims, their own training may not provide them with the psychological and self-maintenance skills required to readily comprehend their traumatic experience or to understand and deal effectively with the aftereffects. Many of these crisis workers are unprepared for their own feelings about the incident. They have been trained to help others but not to help themselves. If help is not sought, or if their organizations fail to recognize and respond to the ensuing traumatic reaction, their well being can be threatened. The cost not only to the worker but also to the organization if they fail to recognize the potential effect on workers can be substantial. Projections indicate that hundreds of crisis workers from the New York area will leave their jobs due to their recent trauma exposure. They may experience long term personal stress related damage, however their departures will also ultimately effect the organizations; many such as the New York Fire Department can not afford to have further lose of employees. Trauma can generate contagious effects. This ripple effect extends the circle of impact into the whole organization and the surrounding community. The potential impact on the crisis worker, staff, and others and the cost and performance problems generated within critical occupations signals the importance of recognizing the existing and implications of psychological trauma. Organizations and their HRD professionals must acknowledge that education, prevention, intervention, support and additional research is required to deal with the problems that crisis workers exposed to traumatic events pose for the worker, the organization and the community as a whole. Recognition, preparation and treatment for those affected will help to alleviate this hidden problem and ensure, that, in the course of extending professional assistance to others, the members of these crisis occupations do not suffer unnecessarily. It is the role of the HRD professional to have an understanding of the unique culture of the very self-protecting crisis worker. The HRD professional must re-enforce the effects of repeated exposure to traumatic events not only to the crisis worker but also to the organization itself through education. Education brings about better understanding, which results in alternative solutions to problems.

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The Transfer of Technology of Highly Skilled Foreign Workers for Thai Workers in Thailand

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Few studies have examined technology transfer among Thai skilled-workers. Some studies had reported that Thai people have relatively low technological abilities and skills. This paper reports on research utilzing quantitative and qualitative methods including interviews, observations, and surveys. The study described demonstrates the manner in which information and education are transferred between Thai employees and foreign workers.

Keywords: Transfer of Technology, Technology-Based Training, Thailand

Since the industries in Thailand are growing, the need to face the transfer of the technology and the capabilities to sustain is more. Thailand likes to approach industrialization with open-economy and promote the export goods. In this connection, many researchers have recognized the importance of the transfer of technology. Chantramonklasi (1994) had stated that the transfer of technology could assist the country achieve economic and provide convenient life. The government has also strongly promoted the foreign investment in the industry. For instance, the government has provided some training program, industrial promotion, reduce tax, establish the government unit such as Board of Investment (BOI) to look after the foreign investment, and promote exports. In addition, the government has encouraged some high technology small business, which need the most modern technology in order to complete effectively manufacturing or providing service. These situations mean that the investment policy of the government is increasingly concerned with the entry of domestic firms into industrial market. The country needs to have the investment policy to innovate Thai industries in the world competition and encourage more transferred technology.

The investment policy is very essential to convince foreigners to invest in Thailand. Since the investment policy of the Thai government allows foreign labors to work here, it has created some concerns. For example, there are more and more foreign workers brought in and caused Thai workers have less opportunity to get a job. The second concern is that the transfer of technology has not been accrued including the limited transfer of technology for local staff. The scarcity of skilled local labor and the restriction found in technology transfer agreements, which were imposed by technology suppliers is another concern.

Unfortunately however, few studies have looked specifically on how technology has been transferred for Thai skilled-workers. Some studies had reported that Thai people had been trained with the poor communication of technology information. Within the immed iate locality, the manufacturer may be aware of the technology requirements for established products and it is still difficult to obtain or develop new product design. In addition, some studies have shown that even where information on technology is avail able, lack of relevant skills with low level of education make difficult to achieve with unfamiliar or new technology. Infrastructure development needs to be a step ahead of the industrial development. It should be a forerunner before technology transfer.

The project purposes thus rest on how technology has been transferred in the manufactures. The project will apply quantitative approach and documentation approach including interview, observation, and survey. Moreover, data collected for the project will be analyzed and provided the broader pictures in term how one relates to transfer the technology and how to develop Thai workers.

Objectives

To study how technology has been transferred from foreign workers to Thai workers.

Literature Review

Thailand's economic growth since the late 1980s has been increased. Then, it makes technology become more important element for the national development. The current industrial policies in Thailand are designed to promote manufactured exports, labor-intensive industries and agriculture-based industries. The BOI is responsible for these activities. The organization is empowered to offer incentives, guarantees, and measures to protect industries against competition, and special exemptions from various laws. Then, many manufactures have imported the technology from abroad in order to assist them in the production and management. For instance, there are many manufactures in Thailand which are Thai-Japanese joint-ventures such as Toyota

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(Thailand)Co.Ltd., Nissan (Thailand) Co. Ltd, and Isuzu Motor Co. (Thailand) Ltd. Large and medium enterprises the machinery industry are also the form of joint-ventures, Thai investors holding about 50 percent of the total investment or less. In the electronic and electrical appliances industry, these are now about twenty large companies producing television sets, radio, refrigerators, integrated circuits, parts of computers such as Korat Denki Company, Minebear Company, Magnecomp Group Corporation. Many machines and equipments have imported from abroad (Cooper, 1994). It shows that the industrial development has been a strong reliance on imported technology.

In Thailand, the modern of science and technology has involved the promotion of direct foreign investment and the encouragement of applied research activities by local university. Foreign direct investment is seen by policy-makers as a way by which technology can be brought into the country, while the local research institute and universities provide the skilled human resource base to absorb the new information. The general perception, however, is that the strategy of building capacities in local institutions has not met with much success, in part because of the absence of effective linkages between the public and private sectors, as well as the lack of explicit measures and schemes to promote technological literacy.

These situations have created some concerns about the transfer of technology included the limited transfer of technology to local staff, the restrictions found in technology transfer agreements which were imposed by technology suppliers, the stated and hidden costs of technology agreement, the inappropriateness of the technology introduced, and the scarcity of skilled local labor. For instance, the Thai-Japan joint ventures have failed to transfer the know-how technology to Thai local partners. (Chantramonklasri, 1994)

Other concern is that the report traces the vicious circle within which many local companies are caught. It begins with a market for technology in which a small number of suppliers face a large number of buyers, with whom costs, terms and conditions are determined individually on the basis of crude bargaining power rather than competition. Moreover, the buyers are usually uninformed and lack the technical and legal expertise to evaluate alternative sources of technology and to negotiate effectively with suppliers. As a result, contracts are concluded to the advantage of the supplier and the buyers accept restrictions, which have the effect of increasing their dependence on the technology suppliers.

Although the transfer of technology is usually identified with the inflow of foreign capital, there have been questions raised about the prices paid for technology. The disadvantaged position of the buyer and his ignorance about the costs of alternative sources has resulted in unreasonably high profits for the owners of technology (Cooper, 1994). The government study reports that the evaluation of an offer to supply technology grows in complexity when the technology is offered in packaged form, with technical assistance and management provided (Khanthachai, 1987). The offer may contain many hidden costs. In addition, some reports provide information to support the contention that the outflows of funds (foreign remittances and expenses for import receipts) have exceeded fund inflows (foreign capital infusions and export receipts) among Thai joint ventures that have been paying copyright fees and royalties (Ng, 1986).

The technologies that foreign firms have introduced are generally inappropriate or excessively capital-intensive, given the labor surplus conditions in these countries as mentioned earlier. Moreover, these technologies are seldom adapted to make better use of local factor endowments. Some foreign companies had introduced second-hand equipment and passes it off as "labor-intensive, appropriate technology" (Chantramonklasri, 1994). These are usually machines that had become less efficient and had to be replaced in the originating country. The unfortunate impact on the host country or on the technology buyer is usually high maintenance costs, which offset the benefits from increased employment, and cheaper equipment costs.

The shortage of skilled labor is regarded as the another major problem to the effective transfer and absorption of technology. The various skills training programs are unable to cope with the needs of the extremely large labor pool and the requirement of industrial firms (McLeod, 1988). Moreover, the educational system has thus far failed to keep up with the demands for more science-based technically grounded and relevant educational programs. The potential for technological absorption and control is related to the availability of qualified and experienced technical personnel. Although such individuals were to be found in most Thai research institutions, the report showed that such institutions have been unable to adequately supply the requirements of private industry (Khantthachai, 1987).

The limited utilization of R&D capability is isolated and disconnected in the real world. The researchers carry out technology activity in an improper manner. Eventhough there is an attempt to commerce R&D programs and it is often unable to have an impact on the industry. A well-known argument often used to explain this ineffectiveness is that industrial firms have a tendency to utilize proven technologies from foreign sources, thus limiting the demand for local scientific and technological capabilities(Ng, 1986). This argument remains highly questionable because it presumes that those"centers of excellence" have available the kinds of products which are relevant to the needs of their potential clients. As noted by an empirical study, "industrial firms tend to doubt the ability and effectiveness of universities and public technical institutes to solve practical industrial problems" (TDRI, 1992a, p. 85).

According to some statistics in the country report, advanced countries have a higher level of national investment in R&D. For example, Japan spent about 3 percent of its GNP and newly-industrialized countries like Korea, Taiwan and Singapore spent about 1 to 2 percent of their GNP in R&D (TDRI, 1992). The R&D investment in Thailand in recent years was less than 0.2 percent of GNP. It shows that Thailand is less interested in R&D investment which causes to develop the country slowly.

Other problem is that many firms can draw sources of technology from foreign sources and that lead the firms to feel that there is no need to invest in R&D. Since the firms receive efficient technology, they then assume that everything will be fine. They would take a passive action until the new production system has arrived. Therefore, they can simply engage limited technological learning such as only at the minimum level needed to operate the systems. Indeed, it is less awareness of the industrial firms to develop the in-house technology.

Many reasons mentioned above have caused Thailand to hardly ready for the transfer of technology and have the limitation of competitiveness. Moreover, there are many new market economy with lower wages and more sufficient sources. Many developed countries have become more modern and research new production and make many new products which make Thailand will become less competitive and could become at risk in the future. It is thus highly possible that without substantial efforts to develop better capability in science and technology to support industrial development. Thailand may face a major economic and social crisis in the near future.

Furthermore, transfer capabilities and motivation of the enterprise supplying the industrial technology each have an important bearing upon the effectiveness and efficiency of technology transfers. The competence of the transfer agents, including their ability to design an easily transferable technology package, is an important factor. The supplier enterprise and its transfer package report a combination of documentation, training and technical assistance. Motivation of the technology supplier depends in large part on the transfer mode and the potential return the supplier hopes to realize an effective and efficient transplant.

Many problems mentioned above show the technology gap. It represents the differences in the levels of technical competence of the supplier and the absorptive capabilities of the recipient enterprise. The extent of this gap and the time and resources will take to effectively implant a technology package that will depend on enterprise differences in terms of likeness, scale, and sophistical of product line, quality of metallurgy, quality control standards, and relative levels of general, "system-specific", "firm-specific" technical knowledge.

Conceptual Framework

The transfer of technology gap between developing and developed countries is happening for long time. It causes the technology gap wider and wider. There are a few countries in Asia, which have crossed the gap and developed a national technology of their own. The essential question is why. Why has so little worthwhile know-how flowed to developing countries? It is the believe that there is no one answer to the question. There are some studies to learn the success and failures of some factories. Some failure stories in the transfer of technology are because of poor negotiating technique and poor contract drafting, poor English language, and poor skilled-labor. Some success stories occurred because the negotiation knew what they wanted, knew how to bargain for it, and knows how to draft the necessary contract.

This paper is to study how technology has been transferred from foreign labors to Thai labors under the concept of the transfer of technology that defines as the act of sharing know-how by such devices as constancy, joint ventures, gifts, licenses, franchises, and patents. In this case, it focuses on the transfer of technology in the manufactures because the industry in Thailand is more promoted and more buying - selling technology in this area than other area.

The project took into account the aboved definition as an assist to determine of how-to transfer the technology. The technology can be transferred and adapted by demonstrations, dissemination, training, constancy and management assistance. Some of the questions for investigation are : to find out which technology do you think that Thai workers' skills are not as good as they should, Does the manufacture provide training to Thai workers? How does the manufacture develop Thai workers after they have the transfer of technology? What are the advantage and disadvantage for hiring foreign workers? How can the government assist you with the transfer of technology? This, in turn, will assist Thai manufactures to know their problems, and to learn about the transfer of technology .

Research Methodology

1. Research Limitation
   The research is to study a model and technique how to transfer technology to Thai workers.
2. Sampling Population
   Sampling population focused into four groups:

1. Foreign workers are from Japan, China, India, Taiwan Australia, German, South Korea, France, and America.
2. Thai workers that work as labor force in the manufactures.
3. Senior administrators in the institutions.
4. Entrepreneur or human resource managers.

Research Questions/Propositions

How can the transfer of technology from foreign workers to Thai workers?

Random Sampling Technique

The size of sample is 350. It consists of:

1. Foreign workers	150 persons
2. Thai workers	100 persons
3. Entrepreneur or HR manager	50 persons
4. Institutions	50 persons

Data Collection

Data collection is to:

1. Collect information from the secondary source by collect data through statistics, type of business, type of technology, labor workforce, labor demand.
2. Collect information from the primary source by interview with Thai and foreign workers, entrepreneur, or human resource managers.

Words of Definition

The transfer of technology defines as a knowledge transfer from supplier (usually a developed country) to the receiver (a developing country).

Foreign workers define as foreigners who are granted the work permit to work in Thailand by the BOI.

Thai workers define as Thai workers who work in the manufactures.

Human resource manager defines as the manager who is responsible for personnel management .

Institution defines as Thai higher education institution.

Entreprenures define as one who organizes a business/manufacture.

Result and Findings

The questionnaires were provided for four groups. They were 50 HR managers/entrepreneur, 100 Thai labors, 150 foreign labors and 50 institution administrators. The research took about one and a half months in the field. The study included twenty four manufactures from four regions of Thailand and ten institutions. The section will discuss some important issues on how foreign workers transfer the technology to Thai workers.

The first set of questionnaire was distributed to the HR manager/entrepreneur. The result displays that every factory has hired foreign workers with the working permit to work in Thailand. Most of them came from Japan, Korea, China, Taiwan, Philippines, Malaysia, Singapore, Pakistan, and India. A few of them came from the United States, Canada, the Britain, France, Italian, and Australia. These people hold the positions of senior and middle manager and technician. Examples of positions are mechanical manager, marketing manager, managing director, quality audit manager, shift supervisor, maintenance supervisor, R&D manager, production manager, tooling design specialist, process development manager, and information system manager. Many responses have stated that some positions have transferred the technology in order to increase the experience and specialist for Thai workers to work efficiently. They also mention that there is an organizational policy reinforced the transfer of technology more than 76% in the manufactures. The reasons are that Thai workers cost cheaper and have ability to do the job. In order to transfer the technology in the manufactures, the result displays the four type of the transfer of technology in Table 1 and the method of the transfer of technology in Table 2 as shown below.

Table 1. *Type of the Transfer of Technology in the Manufactures*

Type of the Transfer of Technology	Percent
Mechanism	80.9%
Production	70.2%
Management	51.1%
Marketing	31.9%

Table 2. *Method of Transfer of Technology in the Manufactures*

Method of the Transfer of technology	Percent
On the job training	89.4%
In-house training	76.6%
Training abroad	61.7%
Training in Thailand	51.1%

ce the transfer of technology has occurred, the responses (76.6%) are willing to replace foreign workers in the middle management such positions as plant manager, control manager, mechanical technician, safety and environment manager, production technician. The factory also has the plan to continuous the development of Thai labors in order to keep up the new technology. They will provide coaching, in-house training, simulator, require the self-evaluation, and do the portfolio.

The responses also state the advantage and disadvantage for hiring foreign workers as shown below;

Advantage	Disadvantage
- transfer the technology for Thais	- highly cost
- exchange of culture	- conflict culture
- easily to communicate with mother company	- language barrier
- highly experience and specialist	- hardly transfer the technology
- provide new technology and knowledge	- difficult to apply for Thai visa
- provide suggestion and recommendation	- look down Thai people

On the government side, the responses indicate the need of some assistance from the Thai government as follows:

- encourage Thai people to learn foreign language
- train Thai people for foreign culture
- improve the school curriculum including teaching and learning
- send students for training
- reinforce the law for foreign labors to do something for Thai society
- coordinate between the government and industry
- provide the training package
- establish the center of consultation about the expert in the technology for Thailand and abroad

The second set of questionnaires was distributed to foreign workers. The response from the survey show that the average age of the foreign workers is 41 years old, the average years of experience are 14 years and earn the average salary is 80,080 baht ($1,777 per month). The responses are male (98%) and female (2%). Their education in details is shown in Table 3

Table 3. *Level of Education of Foreign Workers in Thailand*

Level of Education	Percent
Lower secondary school	1%
Upper secondary school	20%
2 years college	14%
Bachelor Degree	49%
No answer	17%

The foreign workers are Asia (79.9%), European (11.4%), and America (6.7%). Most Asian came from Japan and followed by Taiwan, China, Korea, Malaysia, Singapore, and India. Their positions are president, vice president, manager, assistance manager, and technician. Their main jobs include quality control, quality audit, organizational management, safety, production design, contact customers, supervise workers, marketing product, investment planning, coordinate, and maintenance. These people came to Thailand because their mother companies sent them to help Thai team members improve their skill, learning, and development. This has created an opportunity to train and transfer the technology to Thai workers. However, there are some difficulty for the transfer of technology to Thai workers in several reasons. For example, language barrier,

communication gap, and conflict culture. Others include Thai staff will quit the job after training in order to get a better job, some Thai labors don't pay attention to what had been taught, and both foreign and Thai workers sometimes misunderstanding.

The third set of questionnaire was distributed to Thai workers. The survey shows that the average age of Thai workers is 31 years old, the average years of experience are 5 years, and earn average salary about 20,262 baht ($406 per month). The responses are male (83%) and female (17%). Their education in detail is shown in Table 4.

Table 4. *Level of Education of Thai Workers in the Manufactures*

Level of Education	Percent
Lower secondary school	16%
Upper secondary school	22%
2 years college	5%
Bachelor degree	49%
Master degree	6%
No answer	3%

The responses are holding the positions in the middle manager, for instance, head of the technician, and director of production The responses show that these positions can be replaced by Thai people for several reasons. Thai people have more experience, work hard, responsibility, willing to do the job, like challenge job, and always develop themselves. In addition, many responses stated that Thai workers have equal opportunity to progress their job like foreign workers, they work and coordinate with foreign staff and learn the technique from them. The question asked the responses whether they attended the training courses. They all attended the training courses in a variety of areas. The training courses are the industrial orientation, professional manager, internal audit, foreign language, manufacturing, ISO 9000, ISO 14000, safety and save energy, and time management both in Thailand and abroad. The technique for the transfer of technology is to work closely with foreign labors, practice by yourself, testing, coordinate in the project, train on the actual job, and send them for training abroad and other professional conference.

The fourth set of questionnaire was distributed to the institutional administrators. The responses are the public institutions (95%). Their curriculum are in the fields of engineering, technology food, industrial technology, ceramic, business-computer, business-economic, science food, accounting, marketing, hotel, and tourism.

The institution' s policy to produce the graduates for the market labor is to produce graduates who can think, work, be responsible, and communicate including foreign language. The question also asked whether the institutions knew about the need for the number of Thai workers in the manufactures. Many of them don't know (52%) while some institutions have known (48%). The question asked further how they know about the need of factories. The result shows that the institutions knew about the need from province labor council (5.45), announcement of the factories (13.5%), BOI (5.4%), and no answer (75.7%).

In order to help the manufactures find the qualified labors, all institutions have the counseling unit under the different name such as the counseling department, counseling unit, career and development section, career information section where they work closely with students and the manufactures. Their jobs are to provide counseling, finding job for students, coordinate with the Ministry of Education, service on career information.

The responses also display that students in the institutions have an opportunity to learn and practice their skills in the manufactures in order to increase the experience, sometimes attend training short course for 2 months or 23 years in the manufactures. The techniques to train students is implemented in Thailand are shown in Table 5.

Table 5. *Techniques to Train Students in the Institutions*

Techniques to Train Students	Percent
On the job training	76%
Student-teacher learn from foreign workers	49%
Invite foreign workers to teach in school	35%
Learning through a documentation	15%

Some problems in the Thai institutions regarding the production of graduates for market labor are:

- unclear the national policy for the higher educational level
- a lack of personnel and equipments
- less experience teachers to teach
- a lack of budget
- a lack of private coordination
- a lack of language and culture
- old curriculum including teaching and learning
- less activities for students to participate in the field

The final question was to ask whether the government can help to improve the transfer of technology for Thai workers:

- determine how to transfer the technology
- encourage more development of technology
- provide training and more education
- provide the scholarship for further education
- coaching and mentoring
- lecture and participation
- determine the policy on the transfer of technology
- improve quality of education
- coordinate with the foreign investment
- focusing on specialist
- encourage the exchange of technology among the industries
- set up the transfer of technology center
- provide enough budget
- open new curriculum with the emphasis on the foreign language
- encourage more foreign investor to invest in Thailand
- conduct more seminars, workshop, conferences, and other activities that involve the transfer of technology among labors

Conclusion and Recommendation

In this paper, we analyze how technology has been transferred from foreign workers to Thai workers. The finding shows that the majority of foreign and Thai workers are male and holding the position of middle and senior managers in the manufactures. Foreign workers have average experience about 14 years while Thai workers have average experience about 5 years. It could be that the average age of foreign workers are much higher upto 41 years old with more skills while the Thai workers are 31 years old with less skills. It results for the foreign workers to be able to distribute their new and advanced knowledge for Thai workers who have less experience. The foreign workers train Thai workers through the on-the-job-training as the primary vehicle for building the capacity to work efficiency.

The method of the transfer of technology range from on the job training, in-house training, training abroad, and training in Thailand in the areas of mechanism, production, management, and marketing. It shows that there are four main methods for the transfer of technology that most manufactures in Thailand implemented and work well. The manufactures still feel that it is necessary to hire the foreign workers because they would like to hire their own people to do their job. They feel that their people can do better job and trust them more. In addition, there is the recognition that the Thai government and the manufactures have play major roles to facilitate and support the process of technology transfer. The government is encouraged to support the process through the provision of required incentives, educational infrastructure and support institutions. It must be a strong collaboration between the manufactures and the government for the transfer of technology.

The educational curriculum has offered the courses that are not quite modern and not geared to keep up with the changes in technology. The responses from the manufactures had stated that the graduates can't do the work. However, the institutions have tried to help by providing practicum and have students do the actual work while in school. The equipments in schools are not new for students to practice. It also a lack of qualified teachers resulted in the incomplete or improper transfer of technology. It is also a high turnover among skilled workers resulted in the lack of continuity in technology transfer to the local manufactures . Consequently, the ability of Thai workers to absorb and adapt technology is weak.

New Knowledge to HRD

This research can contribute to the new knowledge in HRD that there is a growing awareness between the manufactures and the transfer of skills available to increase the productivity and growth in industrial production. It displays the important for Thai workers to be better educational and training opportunity in order to do a better job and compete in the world manufactures. Therefore, the education and training has played the essential role to develop the workers' skills. In addition, the government must be a strong support for the process of technology transfer.

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